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AN EVALUATION OF GENTLE TEACHING AND VISUAL SCREENING IN THE REDUCTION OF STEREOTYPY

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Gentle teaching and visual screening techniques have been used to control severe behavior problems in persons with mental retardation. An alternating treatments design was used to compare gentle teaching, visual screening, and a task-training condition in the reduction of the high-level stereotypy of 3 persons with mental retardation. Following a baseline phase, a task-training condition using standard behavioral techniques was implemented to establish the effects of training the subjects on the tasks. Results showed a modest decrease in stereotypy. This phase was followed by an alternating treatments phase in which visual screening, gentle teaching, and baseline conditions were compared. Both procedures were superior to the control condition in reducing stereotypic behavior, with visual screening being more effective than gentle teaching. When compared with data from the prior phase, gentle teaching was found to be more effective than task training for 2 subjects but less effective for the 3rd, whose stereotypy increased during gentle teaching. Two succeeding phases in which visual screening was implemented across two and then all three daily conditions reduced stereotypy further to near-zero levels. An additional phase with 1 subject demonstrated that the treatment effects of visual screening were easily replicated across therapists. Mixed and idiosyncratic changes in collateral behaviors occurred. For example, "bonding," the goal of gentle teaching, occurred at the same low levels under both treatments, contrary to the predictions of gentle teaching's proponents. The results indicate that gentle teaching may not be the universal treatment of choice for stereotypy its proponents suggest, and that it requires further empirical evaluation.

DESCRIPTORS: stereotypy, gentle teaching, visual screening, alternating treatments design, bonding

"Gentle teaching" is an approach to treating the maladaptive behaviors of persons with mental retardation that has more of a philosophical basis than an empirical one (Casey, McGee, Stark, & Menolascino, 1985; McGee, Menolascino, & Menousek, in press; Menolascino & McGee, 1983). The stated goal of gentle teaching is to establish for the client the reinforcing value of social interaction so that "bonding" will occur between the client and therapist. This bonding then enables the therapist to gain interactional control over the client's behavior. McGee and his colleagues (Casey et al., 1985; McGee et al., in press; Menolascino & McGee, 1983) contend that the unique character of gentle teaching lies in its emphasis on a humanizing and respectful posture toward persons with mental retardation and its rejection of punishment techniques.

McGee (1985d) reports that gentle teaching has been successfully applied to 650 clients at the Nebraska Psychiatric Institute over the last 5 years. These clients represented all levels of retardation and displayed severe behavioral problems including self-injury, aggression, stereotypy, antisocial behavior, and promiscuity. Only 13% were reported to require additional treatment at the facility, and 5% returned twice. These figures suggest that gentle teaching is a powerful treatment approach because

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the average stay at the facility was only 28 days (McGee, 1985d).

Unfortunately, there has been no independent evaluation or replication of this success. There are serious limitations in the methodology used by McGee and his colleagues to evaluate their approach (see Mudford, 1985; Singh, 1983). For example, treatment results are often simply informal observations or descriptions of the client's progress, pre- and posttreatment videotaped vignettes, or "treatment data" with no accompanying baseline or other control condition. Naturally, these methodological deficiencies (a) render any inferences of a causal relation between the application of gentle teaching treatment and behavioral change invalid because the possibility of extraneous variables influencing the results cannot be discounted, and (b) raise questions regarding the validity of the criteria used for judging treatment success as well as the reported success rate with gentle teaching.

Furthermore, although McGee and his colleagues (McGee et al., in press) claim to have developed a new treatment approach, a careful analysis of videotapes (McGee, 1986) and written material suggests that it is a combination of some simple management techniques with what is essentially a differential reinforcement procedure. Indeed, others (e.g., Glynn, 1985; Mudford, 1985) have suggested that gentle teaching is nothing more than a complex package comprised of well-validated behavior management techniques such as ignore–redirect–reward (Favell, McGimsey, & Schell, 1982), rearranging the environment, establishing stimulus control (Gold, 1972), errorless learning (Cronin & Cuvo, 1979), shaping and fading (Stokes & Baer, 1977), teaching quietly and limiting the therapist's use of speech to maximize the reinforcing power of the human voice (Gold, 1972), gradual guidance, and providing a high density of reinforcement (in this case tactile) and then reducing it.

The goals of the present study were to provide an empirical evaluation of the clinical effectiveness of gentle teaching and to compare its effectiveness with a well-researched procedure, visual screening (McGonigle, Duncan, Cordisco, & Barrett, 1982), in the treatment of stereotypy, a prevalent maladaptive behavior of persons with mental retardation (LaGrow & Repp, 1984). A secondary goal was to determine the effects of these procedures on collateral behaviors, especialy social interaction with the therapist for evidence of bonding (which is integral to the expected effects of gentle teaching), as well as on-task and disruptive behavior.

METHOD

Subjects

Three institutionalized persons with mental retardation were selected to participate because they displayed high stable rates of stereotypy. They were classified as profoundly mentally retarded on the American Association on Mental Deficiency criteria (Grossman, 1983). Informed consent was obtained from their parents, and the research protocol was approved by the ethics committee of the institution.

David was a 21-year-old man who had been institutionalized for 12 years. His age-equivalent score on the Vineland Adaptive Behavior Scale was 21 months. David had no expressive language but could follow simple instructions and perform basic self-care skills under supervision and with occasional assistance. His stereotypic responding consisted of head weaving, hand regard, hand sniffing, and manipulating objects in a repetitive manner. Vocational placement within the institution was precluded because of his high-rate stereotypy, which was also a source of embarrassment to his family during regular weekend trips with them to the community. His medication, which was kept constant during the study, was 5 mg Stellazine, three times a day, for psychotic behavior.

Kevin was a 28-year-old man who had a long history of institutionalization. His age-equivalent score on the Vineland Adaptive Behavior Scale was 9 months. Kevin had no expressive and very limited receptive language. He had no self-care skills other than feeding himself. He was affected by mildly spastic quadriplegia but was mobile and had functional control of all limbs. Kevin had a long history of stereotypy including finger flicking (usually with objects) and repetitive vocalizations. He often de-

stroyed training materials in order to flick pieces of them and actively resisted having these items taken away. His medication, which was kept constant throughout the study, was 15 mg Probanthine, twice a day, for digestive discomfort.

Paul was a 7-year-old boy who had been institutionalized for 2 years. His age-equivalent score on the Vineland Adaptive Behavior Scale was 14 months. His expressive vocabulary was limited to one word, and he had little receptive language. He had no self-care skills other than feeding himself. Paul usually attempted to escape from structured learning situations, and if prevented from doing so, would mouth his hand or objects, perform other stereotypic manipulations with objects, or stare into space for long periods. If physically directed to perform a structured activity he would whine, scream, and occasionally head-butt or bite staff. He received no medication.

Therapists' Training

All 6 primary therapists were graduate or advanced undergraduate students in psychology and had previous experience in behavioral observation and recording techniques. Prebaseline video recordings of several potential subjects were made so that the therapists could practice their recording skills. The baseline was not instituted until interobserver reliabilities on each target behavior were greater than 90%.

The therapists reviewed relevant literature on the use of visual screening (e.g., Barrett, Matson, Shapiro, & Ollendick, 1981) and gentle teaching procedures (McGee, 1985a, 1985c, 1985d; McGee et al., in press; Menolascino & McGee, 1985), viewed several gentle teaching videos (McGee, 1986), and modeled and role-played the procedures. They then practiced the gentle teaching technique using several residents who were not in the study. They were deemed proficient when their independent efforts at executing the gentle teaching procedures were judged by an independent rater to match those of the therapist on the gentle teaching videotapes (McGee, 1986). The therapists worked in pairs, each acting in alternate sessions as therapist and observer, and each pair worked exclusively with its subject throughout the study.

In the final treatment phase for Paul, 6 additional personnel were recruited from his regular residential staff to act as therapists. Their training consisted of a brief discussion of the study's rationale, a review of the behavioral definitions, and procedural demonstrations. This phase was used to determine the extent to which prior effects could be maintained by a facility's regular staff.

Setting

Three sessions per day were conducted in a therapy room (7.6 m by 3.8 m) located adjacent to the dayroom within each subject's living unit. The room was carpeted and furnished with a large table and comfortable upholstered chairs. Treatment sessions for David and Kevin were conducted 3 days per week between noon and 2:30 p.m., whereas Paul's were conducted 5 days a week beginning at 2:30 p.m. The observer was in the room during each session.

Functional, age-appropriate tasks (Brown et al., 1979; Reid et al., 1985) were chosen for each subject and were kept constant throughout the study. David and Kevin's tasks were sanding a breadboard and assembling cardboard divisions for packing materials. Paul's tasks included the sanding task as well as gluing pictures on paper and drawing on paper with a ballpoint pen.

Behavioral Definitions

Stereotypy and several collateral behaviors were recorded. Stereotypy was defined as consistent, repetitive motor behavior, excessive or pathological in rate, frequency, and/or amplitude, with no apparent adaptive significance (Baumeister, 1978). The specific behaviors recorded were: (a) *mouthing*: mouthing or sucking hands, clothing, curtains, table or other objects; (b) *hand flapping*: flapping hands; (c) *vocalizations*: humming, "raspberry" noises; (d) *objects*: finger flicking, twirling, twiddling, patting or other repetitive manipulation of objects; (e) *body*: repetitive manipulation of hair, poking finger in ear, tapping head; and (f) *other*: a catch-all category of other stereotyped acts, in-

cluding head weaving, looking repeatedly from materials to therapist and back with a wide-eyed stare, hand regard, staring into space, hand sniffing.

Collateral behaviors included (a) *disruptive behavior*: 1) out-of-seat: standing, walking, or lying down when subject is supposed to be seated at a table; 2) resisting treatment: attacks toward materials—tearing, breaking objects, sweeping objects off surface of table, overturning furniture; attacks toward therapists or others—kicking, pinching, biting, striking, grabbing hair or body of other person, and pushing therapist away; self-injury: biting and hitting self; and screaming and whining when requested to work. (b) *On-task*: 1) any activity directed toward completion of the task, constructive manipulation of materials in the manner directed without therapist's assistance; 2) compliance with therapist's instructions. (c) *Task training*: active manipulation of materials with full or partial guidance by therapist. (d) *Bonding*: 1) smiling—directed at the therapist either spontaneously or in response to therapist; 2) physical approach—subject moves to within 0.5 m of the therapist, demonstrating eye contact for more than 2 s, touching, hugging, or shaking the hand of the therapist. Because bonding has not been operationally defined by the proponents of gentle teaching, this definition was based on a clinical case evaluation provided by McGee (1985b): "he became closely bonded to his daily caregivers, smiling frequently and responding appropriately to interaction" (p. 16).

Data Collection and Reliability

Each day, there were three 30-min sessions separated by a 5- to 10-min changeover break. Data were collected using a partial interval recording technique. Each session was divided into 180 10-s intervals; the end of each interval was signaled to the observer through an earphone connected to a 10-s beeper. The observer then recorded the behavioral categories that occurred within each interval. Because visual screening lasted until the subject ceased his disruptions for 5 s, it was necessary to equate the free response time available to subjects during the comparison of gentle teaching and visual screening. To do so, recording was stopped and restarted after each screening was given. The observer did note, however, the incidence and duration of each visual screening.

Reliability checks were conducted in 25% of the sessions by an independent observer and distributed evenly across all phases. In addition, checks for observer drift were made on approximately every 12th session by a second independent observer. Reliability was determined by a point-by-point agreement method such that an agreement was defined as both observers recording the presence or absence of a behavioral category during the same 10-s interval. The percentage agreement formula was then used to calculate agreement for occurrences and nonoccurrences for each behavioral category.

The mean interobserver agreements for David for occurrences and nonoccurrences (with the ranges in parentheses), respectively, were: stereotypy—93% occurrence (73% to 100%) and 96% nonoccurrence (74% to 100%); disruptive behavior—99% (80% to 100%) and 99% (96% to 100%); on-task behavior—96% (85% to 100%) and 85% (63% to 100%); task training—97% (71% to 100%) and 99% (96% to 100%); and bonding—89% (67% to 100%) and 99% (92% to 100%). Those for Kevin were: stereotypy—96% (75% to 100%) and 98% (83% to 100%); disruptive behavior—95% (67% to 100%) and 99% (96% to 100%); on-task behavior—83% (50% to 100%) and 95% (87% to 100%); task training—90% (65% to 100%) and 85% (61% to 100%); and bonding—100% and 100%. The means for Paul were: stereotypy—96% (73% to 100%) and 92% (57% to 100%); disruptive behavior—96% (77% to 100%) and 94% (67% to 100%); on-task behavior—92% (71% to 100%) and 98% (92% to 100%); task training—96% (84% to 100%) and 89% (65% to 100%); and bonding—98% (75% to 100%).

Experimental Design

An alternating treatments design (Barlow & Hayes, 1979), along with a no-treatment control condition, was used to compare the effectiveness of

gentle teaching and visual screening procedures. After the initial comparison, the most effective treatment was implemented across sessions in subsequent phases to demonstrate that clinical control had been achieved. A number of steps were taken to avoid the possible risks of multiple treatment interference due to the subjects' failure to discriminate among the treatments. These included alternating each member of each pair of therapists following each session, developing condition-specific cues, and presenting the cues to the subjects immediately preceding the appropriate condition. These cues are described below.

The following sequence of phases was instituted with all subjects: baseline, task training, Alternating Treatments 1, Alternating Treatments 2, and visual screening. An additional phase, replication of effects across therapists, was implemented with Paul.

Phase 1: Baseline. In this phase and in all subsequent no-treatment control sessions, tasks were available and the therapist modeled their use at the beginning of each session. The discriminative cue for this phase consisted of the therapist announcing "_____ (subject's name), we are going to do some work now" and describing and modeling the tasks. The therapist sat approximately 1 m from the subject throughout the session but did not initiate any interaction unless the subject left his seat and it was necessary to direct him back to it. No other instructions or interventions were used. No consequences were delivered for stereotypy other than redirecting the subject to the task. This phase lasted 3 days for all subjects.

Phase 2: Task training. In this phase, the effects of active task training on stereotypy were assessed. The therapist announced: "_____, let us do some work" and immediately directed the subject to one of the tasks. The task-training procedure consisted of standard behavioral techniques such as graduated physical guidance, verbal instructions, and the use of verbal and tactile reinforcement contingent on compliance with therapist directions or on-task behavior (see Singh & Millichamp, 1987). No consequences were delivered for stereotypy other than redirecting the subject to the task. This phase was conducted in two of the three daily sessions with the baseline control phase being conducted in the other. It lasted for 4 days for David and Kevin and 7 days for Paul.

Phase 3: Alternating Treatments 1. The two treatment conditions, gentle teaching and visual screening, and the baseline control were each assigned to daily 30-min sessions in the counterbalanced order described above. The conditions were:

1. *Gentle teaching.* The procedure of "teaching quietly" (McGee et al., in press) was selected as the discriminative stimulus for this condition because it was considered to be one of the most salient features that distinguished gentle teaching from the other treatments being used. Teaching quietly has been defined by McGee et al. as "using minimal verbal instructions in order to maximize the power of verbal reward and gradually using more language as the reward-learning takes hold. This requires using non-verbal means of communication (e.g., gestures and signs) along with teaching quietly to facilitate correct responses and to maximize the power of verbal reward." Other relevant components of the gentle teaching package advocated by McGee et al. and used here included (a) beginning the session with the therapist approaching the subject and saying his name once, (b) directing the subject to perform a task using gestures and physical prompts, (c) speaking only when enthusiastically praising compliance and approximations to on-task behavior, and (d) ignoring stereotypy itself but redirecting the subject to perform the task. These components adequately characterize gentle teaching and adhered closely to the procedures used in the gentle teaching videotapes (McGee, 1986). The difference between this condition and task training is the "teaching quietly" procedure because the other procedures are essentially the same as in the previous phase.

2. *Visual screening.* The discriminative cue for this condition consisted of the observer modeling the subject's stereotypic behaviors while the therapist said "Look _____(subject's name), when you do this _____or _____, I will do this to you" and demonstrated the screening procedure by

applying it to the observer. "Now, let us do some work." The subject was immediately directed to a task and the task-training procedures were used. Each occurrence of stereotypy resulted in the subject's eyes being covered by the therapist's hand to block his vision while the therapist's other hand held the back of the subject's head (McGonigle et al., 1982). This condition was essentially the addition of visual screening to task training from the previous phase. Screening was scheduled for 5 s but could last longer because release was contingent on 5 s without disruptive behavior.

3. *Baseline control.* This condition was conducted as described in the baseline phase. This phase lasted 8 days for David and 10 days for both Kevin and Paul.

Phase 4: Alternating Treatments 2. Because the visual screening procedure was the most effective treatment for all subjects, it was implemented in two of the three daily sessions with the baseline control condition being conducted in the third session. The order of treatments each day was counterbalanced. This phase lasted 4 days for David and Kevin and 5 days for Paul.

Phase 5: Visual screening. Visual screening was used in all three daily sessions to establish clinical control over stereotypic responding. This was the final phase for David and Kevin and lasted 5 and 8 days, respectively. It lasted 6 days for Paul.

Phase 6: Replication of effects across therapists. This phase was included to assess the degree to which the visual screening procedure could be effectively used by Paul's institutional caregivers. Each day, a staff member became a therapist and was alternated with the original two therapists such that each conducted one visual screening condition per day in a counterbalanced order. This phase lasted 6 days.

RESULTS

David

Figure 1 shows the occurrence of stereotypy and bonding across phases. Stereotypy averaged 96% in the three baseline conditions. In the second phase, task-training procedures were introduced in two conditions and resulted in a reduction in stereotypy to a mean of 45% whereas it remained near 100% in the baseline control condition. During the third phase (Alternating Treatments 1), visual screening immediately and dramatically reduced stereotypy to an average of 14% for the condition, and gentle teaching maintained stereotypy at its prior level of 44%. Figure 1 shows that stereotypy was high during the first two gentle teaching sessions, decreased to a level slightly below that of the previous task-training condition for several sessions, and then began an upward trend. Because visual screening was the more effective procedure, it was implemented in two of the three conditions in the fourth phase (Alternating Treatments 2). The mean percentage occurrence of stereotypy during these two conditions was 7%, whereas it remained at 98% during the control condition. When visual screening was instituted in all three conditions in the fifth phase, the average across the three daily sessions was 8%.

Figure 1 shows that bonding remained at near-zero levels during the baseline phase and the baseline control conditions and then increased and stabilized at low levels in all other treatment conditions. There were no clear differences between the treatment procedures evident in Figure 1. The mean occurrences of bonding were 13% in task training, 16% in gentle teaching, and 13% in visual screening during the third phase and 13% in each of the ensuing two phases when visual screening was the only treatment given.

Disruptive behavior was very low in all conditions and there were no clinically significant differences among them. On-task behavior was at near-zero levels during baseline and throughout the baseline control sessions. It increased during the task-training phase to a mean of 68% and increased further in the third phase such that it averaged 81% in gentle teaching and 88% in the visual screening conditions. On-task behavior in the subsequent two phases that featured visual screening averaged 87% and 88%, respectively. The percentage of intervals in which task training was required decreased over time as David learned to perform the tasks independently. David required

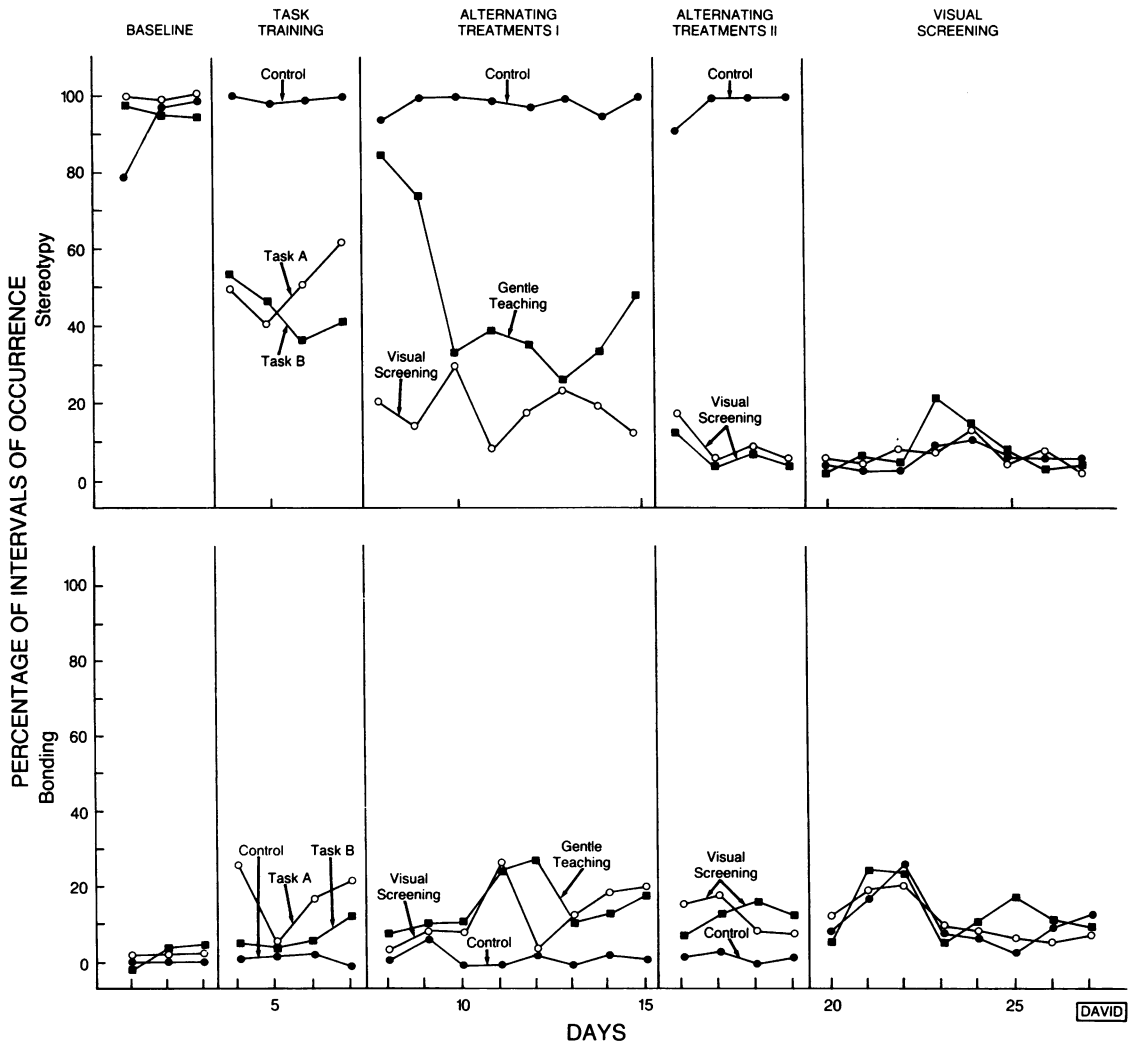

Figure 1. Percentage of intervals of occurrence of stereotypy and bonding behavior across experimental phases by David.

more task training in the gentle teaching condition (9%) than in the visual screening condition (5%).

The mean number of times that visual screening was applied decreased substantially over time, whereas the mean duration across phases varied little. The mean number of screenings per session in each phase were: Alternating Treatments 1, 23; Alternating Treatments 2, 12; and visual screening only, 4. The mean duration per session per phase was 6 s in Alternating Treatments 1 (range, 5 to 20 s), 6 s in Alternating Treatments 2 (range, 5 to 19 s), and 6 s in the visual-screening-only phase (range, 5 to 20 s).

Kevin

Figure 2 shows that high and stable rates of stereotypy occurred during the baseline phase and throughout the baseline control conditions. The mean occurrence of stereotypy was 94% during baseline and 64% during the task-training condition, although it began to return to baseline levels towards the end of each phase. Both gentle teaching and visual screening reduced stereotypic responding, although it was consistently lower in the visual screening phase. The one exception was Day 10 when Kevin fell asleep during gentle teaching. The mean occurrence of stereotypy during gentle teach-

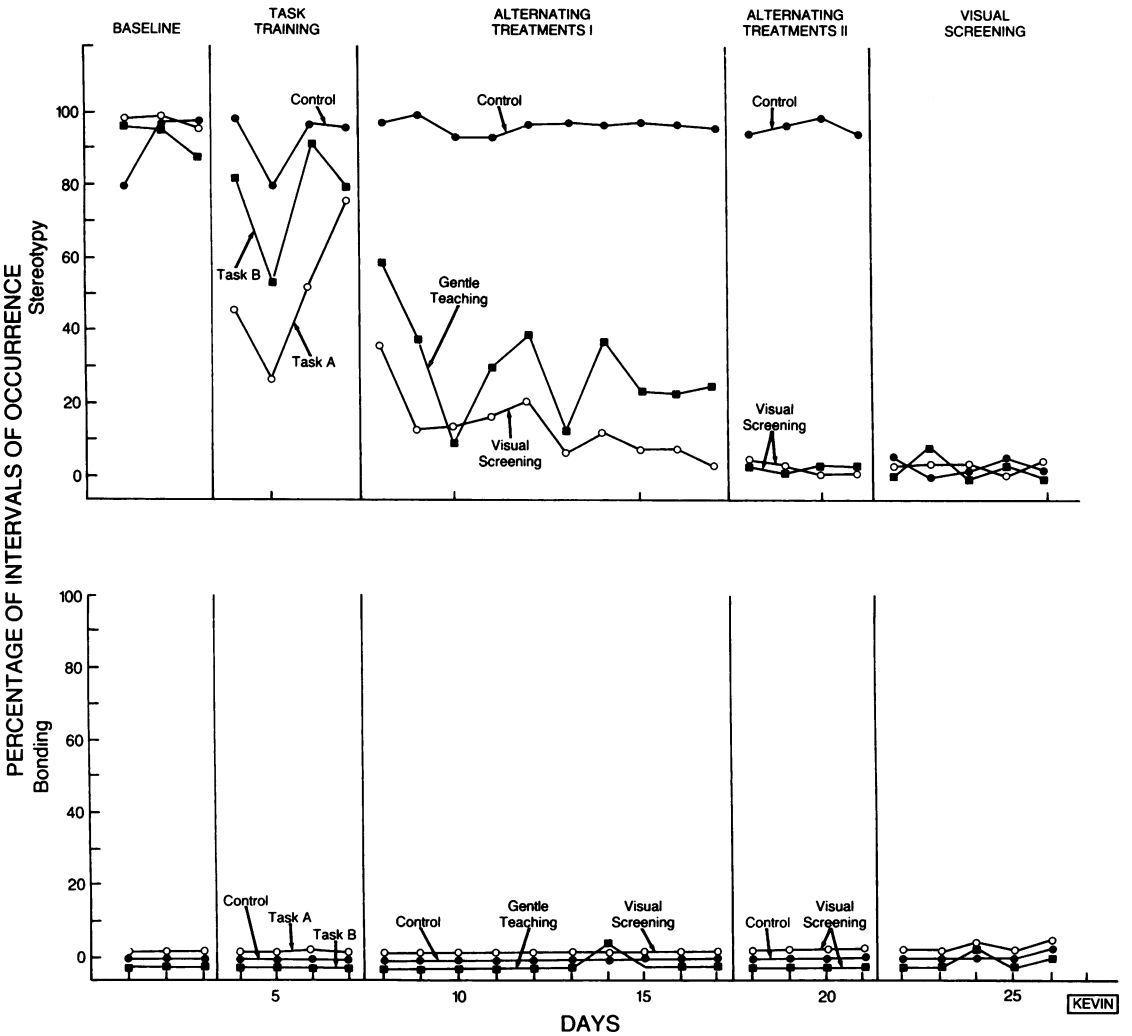

Figure 2. Percentage of intervals of occurrence of stereotypy and bonding behavior across experimental phases by Kevin.

ing was 30%, whereas it was 14% during visual screening. The mean dropped further to 3% when visual screening was implemented in two conditions and remained at that level when visual screening was the sole treatment. Bonding remained at near-zero levels throughout all treatment conditions although it was three times more frequent during the five visual screening conditions than during the gentle teaching condition.

Disruptive behavior averaged 6% during baseline, increased slightly to 10% in the task-training phase, decreased to 2% and 3%, respectively, in the gentle teaching and visual screening conditions, and decreased further to less than 1% in the last two phases when only visual screening was in effect. The means for this behavior under the visual screening and gentle teaching conditions were 1% and 2%, respectively. On-task behavior occurred at near-zero levels during baseline and throughout the baseline control conditions, and averaged 12% in the task-training phase. It averaged 10% and 15%, respectively, in the gentle teaching and visual screening conditions. The mean occurrence was 17% and 20%, respectively, in the final two visual screening phases.

Because Kevin's on-task behavior remained very

low, task training was used throughout all phases as follows: 35% in the task-training phase and 52% and 55%, respectively, in the gentle teaching and visual screening conditions. The percentage was slightly higher in the last two phases in which visual screening was used (62% and 58%).

The mean number of times visual screening was applied decreased substantially over time. The means per session were: Alternating Treatments 1, 25 (range, 5 to 30); Alternating Treatments 2, 10 (range, 5 to 15); and visual screening, 3 (range, 0 to 20). The mean duration of the screening was 8 s in Alternating Treatments 1, 7 s in Alternating Treatments 2, and 7 s in the visual screening phase.

Paul

The mean stereotypy during baseline was 93%. When task training was given in two conditions during Phase 2, stereotypy initially decreased but soon recovered and approached baseline levels (M = 73%). Gentle teaching initially produced a slight reduction in stereotypy, but after the third day it rose to and remained at a level near the baseline control condition (M = 91%). In contrast, visual screening reduced stereotypy to a phase mean of 24% and to 10% by the end of the phase. Stereotypy continued to decrease as visual screening was implemented in more conditions, averaging 20% in Phase 4 and 7% in the fifth phase, in which only visual screening was used. In the final phase, replication of effects across therapists, stereotypy averaged 3% in the sessions conducted by the two original therapists and 4% in the sessions conducted by the new therapists.

Bonding remained at near-zero levels until Phase 4, when it averaged 10%. It averaged 9% in the phase in which only visual screening was used. In the final phase, bonding was 7% in sessions with the original therapists and 3% in the sessions with new therapists.

Disruptive behavior was high in the baseline and baseline control conditions, but a general downward trend occurred thereafter. The mean occurrences were 23% in the gentle teaching and 55% in the visual screening conditions. When visual screening was implemented in two conditions in the next phase, disruptive behavior decreased to 38% and decreased further in the visual screening alone phase to 26%. The mean in the next phase was 34% with the original therapists and 11% with the new therapists.

On-task behavior occurred at near-zero levels throughout the baseline and the baseline control conditions. During the second phase, it increased to 13% in the task-training condition while remaining at 2% in the baseline control condition, thus validating the effects of training. It was 15% in the gentle teaching condition and 11% in the visual screening condition. On-task behavior varied between 8% and 14% in the remaining phases.

The percentage of intervals in which training was given in the task-training phase was relatively low at 33%. However, an increased percentage of training was required in the gentle teaching (i.e., M = 59%) and visual screening (i.e., M = 53%) conditions. Similar levels were necessary thereafter except in the final phase, in which it was 71% with new therapists.

The number of times that Paul was visually screened decreased substantially over time, although the mean duration of the screenings was relatively constant and averaged between 6 and 7 s per screening. The mean number of screenings per phase was: Alternating Treatments 1, 41 (range, 5 to 45); Alternating Treatments 2, 19 (range, 5 to 32); visual screening only, 13 (range, 5 to 36); and in the final phase, 6 (range, 0 to 20).

DISCUSSION

The results showed that although task training, gentle teaching, and visual screening were more effective than a baseline control in reducing the stereotypy of 3 subjects, visual screening produced the greatest and most consistent decrease. Of particular interest was the direct comparison of the effectiveness of gentle teaching and visual screening. Visual screening was clearly the more effective procedure for all subjects; the mean percentage of stereotypy across subjects was 54% for gentle teaching and 17% for visual screening. Visual screening continued to be effective in subsequent phases and, in

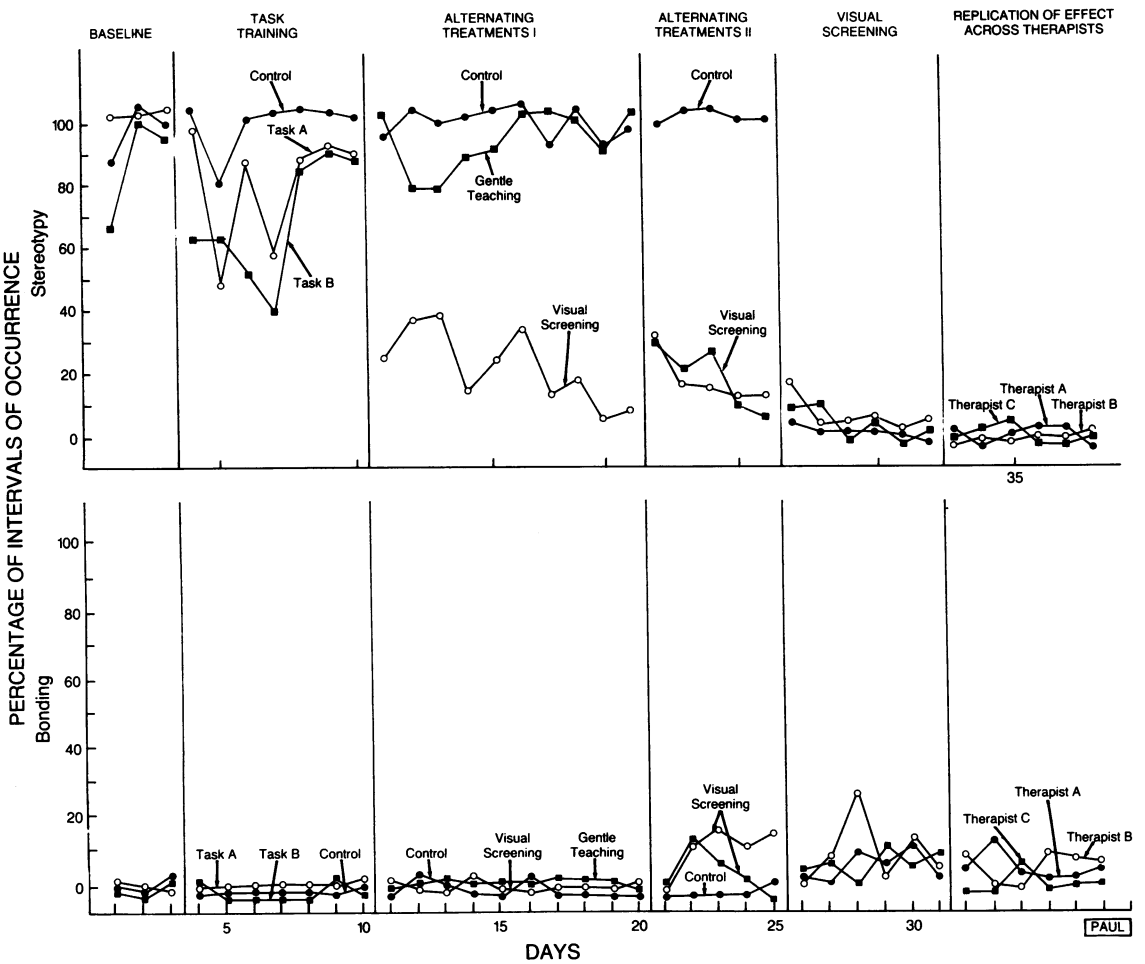

Figure 3. Percentage of intervals of occurrence of stereotypy and bonding behavior across experimental phases by Paul.

fact, reduced stereotypy still further (M = 5%). Stereotypy remained low for Paul even when new therapists were introduced in an additional phase.

The results of the study suggest that the addition of an aversive procedure (i.e., visual screening) to interrupt or punish stereotypy was necessary to achieve a clinically significant effect. As such, they confirm the findings of Barrett et al. (1981) that visual screening was more effective than positive reinforcement alone, and of Koegel and Covert (1972) that a combination of aversive and positive techniques was superior to reinforcement procedures alone in reducing stereotypy. Clearly, this appeared to be the case in the present study, given that the primary difference between the visual screening and gentle teaching conditions was the screening procedure itself; the task-training components are common to gentle teaching and visual screening conditions.

The limited effectiveness of gentle teaching may have been due to the nature of its components. The gentle teaching procedure lacked verbal instructions and required that stereotypy be ignored, thus permitting subjects who did not respond to gestural redirection to engage in stereotypy without interruption. This was especially true for Paul, who switched to staring or stereotypic vocalizations that were not incompatible with on-task behavior when given physical guidance to engage in the task. Indeed, the lack of a programmed consequence for

stereotypy in the gentle teaching procedure allowed this behavior to continue at relatively high levels and may have permitted the inadvertent reinforcement of stereotypy when reinforcers were delivered for appropriate behaviors (e.g., on-task behavior) that occurred simultaneously with stereotypy. Furthermore, the absence of a programmed consequence for stereotypy other than ignoring the behavior is likely to have little effect on that behavior if it is being maintained by any consequences other than social ones. Social attention appeared to be irrelevant to the subjects' performance of their stereotypies and, in fact, all appeared to prefer being left alone to engage in their favored activity, stereotypy. Thus, it is not surprising that ignoring stereotypy had little effect. Indeed, the few studies in which time-out or extinction have been successfully used with stereotypy have generally involved a period not only without social reinforcement but also without access to other effective, powerful reinforcers (Harris & Wolchik, 1979; McKeegan, Estill, & Campbell, 1984). This suggests that gentle teaching may be effective only with subjects whose behavior, including stereotypy, is motivated by social attention. Although not included in the present study or advocated by the proponents of gentle teaching, we think it is imperative that future treatment investigations of gentle teaching be based on a functional analysis of the problem behavior (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982) because we predict that it would be unsuccessful with behaviors maintained by variable(s) other than social consequences.

Further, two current theories regarding the etiology and maintenance of stereotypy suggest that gentle teaching would be ineffective. Lovaas, Newsom, and Hickman (1987) argue that stereotypy is an operant response that is reinforced by automatically produced interoceptive and exteroceptive perceptual reinforcers. The choice of treatment here would seem to be procedures that (a) block the behavior's reinforcers, (b) provide the same reinforcers for an incompatible behavior, or (c) punish the behavior. Another theory (Lewis, Baumeister, & Mailman, 1987) argues that stereotypy is neurobiologically based and that the most efficacious treatment would be based on ". . . information and methods available from the basic and clinical neurosciences" (p. 256).

The results regarding the occurrence of bonding (or more conventionally, prosocial interaction) were interesting. Bonding occurred at low levels, and there were no differences across treatments despite its having been propounded as the goal and result of gentle teaching (McGee et al., in press). Indeed, bonding occurred in all treatment conditions (including task training) for David, did not develop for Kevin, and developed with Paul in the last three phases in which only visual screening was in effect. That bonding occurred in treatment conditions that contained an aversive procedure was not surprising, because such increases in prosocial interaction are well documented (Newsom, Favell, & Rincover, 1983).

It may be argued that the rapid alternation of treatments and therapists precluded the development of bonding at a clinically significant level. The decision to alternate therapists was made to control for possible variations in the attributes and therapeutic effectiveness of the two therapists contributing to the success of a particular treatment condition. Although this decision can be construed as interfering with the development of bonding, the finding that bonding occurred for both David and Paul at similar levels with both of their respective therapists should allay any such concerns. However, it remains to be demonstrated whether pairing a therapist only with a single treatment would have produced greater levels of bonding.

The changes in other collateral behaviors were mixed and idiosyncratic, and there did not appear to be any clear overall difference among the treatments. Paul's disruptive behavior was the only category in which there appeared to be a clear difference in procedural effectiveness. His disruptive behavior was low in the gentle teaching condition and half that displayed in the visual screening condition. This difference appeared to result from an inverse relation between stereotypy and disruptive behaviors in the alternating treatments phase, because as gentle teaching became less effective in controlling stereotypy and that behavior increased,

Paul became less disruptive. Gentle teaching simply intruded less on Paul's stereotypy because the gestural directions were easier for him to ignore by averting his head and staring into space than was the interruption provided by verbal instructions in other conditions. In addition, when redirected, Paul switched to an alternative form of stereotypy such as vocalization, which proved very difficult to control or divert by simple redirection. We speculate that gentle teaching produced less disruptive behavior in Paul than visual screening did because it was less intrusive, less aversive, and easier to escape.

The limited progress made by Kevin and Paul in developing on-task behavior and their continued dependence on therapist-delivered task training once their stereotypy was reduced was an unexpected result. Possible explanations include such factors as the task being too difficult (Weeks & Gaylord-Ross, 1981), generalized response suppression following the use of a punishment procedure (Koegel, Firestone, Kramme, & Dunlap, 1974), or the task itself being insufficiently reinforcing (Murphy, Carr, & Callais, 1986). The task difficulty explanation seems unlikely because the subjects could perform all of the tasks independently. The response suppression explanation also seems unlikely because there was no appreciable drop in on-task behavior from the task-training phase, where no consequences followed stereotypy, to the subsequent phases where visual screening was used. The last explanation appears to hold some credence, because the subjects generally ceased any self-initiated task activity after a relatively brief period. Furthermore, social consequences in the form of verbal praise and touch did not seem to have much impact on Kevin and David and tended to distract Paul from the task. The use of alternative reinforcers may have alleviated this problem.

Regarding side effects, none were reported for Kevin and David under all conditions, whereas both positive and negative ones were noted for Paul. Staff reported that Paul remained seated longer in classroom situations but, on the negative side, he threw empty plates in the dining room during the evening meal that followed his daily treatment. He also had a number of toileting accidents during treatment, especially during the visual screening conditions. Both of these negative side effects were short-lived and did not recur. It should be noted that these side effects cannot be attributed to any one condition because of the alternation of the conditions during the treatment phase.

The results of this study have clear implications for the treatment of stereotypy. They confirmed that visual screening combined with task training is an effective procedure for suppressing stereotypy and indicated that gentle teaching is of limited effectiveness. Furthermore, gentle teaching did not result in any greater levels of positive collateral behavior changes than did visual screening. Overall, our results indicate that gentle teaching is not the treatment of choice if one's intent is to treat stereotypy effectively.

There are a number of issues specific to gentle teaching that need to be addressed. Although the gentle teaching package consists of at least nine component techniques, McGee et al. (in press) state: "There is no uniform formula to determine which of these techniques to use nor how to use them . . ." and that therapists should "develop highly personalized mixtures of these techniques for particular persons . . . with the objective of teaching interactional control" (chapter 5). Because the advocates of gentle teaching do not base their selection of techniques on a functional analysis of the target behavior or some other systematic procedure (e.g., ecobehavioral analysis), independent replication of their methods is very difficult. Indeed, the lack of operational definitions of the teaching procedures and the subjective nature of component selection inherent in gentle teaching mean that any independent investigation can be criticized as deviating from the ideals advocated by its proponents.

The issue of bonding is critical to the concept of gentle teaching. There is some question whether bonding is indeed a dependent variable, as conceptualized in the present study, or an independent variable, in which case this study, with its low levels of bonding during the gentle teaching phase, did not include a basic requirement of gentle teaching. Our premise is that it is a dependent variable based on the fact that the object of gentle teaching is to

"teach instructional control *which leads to bonding*" (McGee et al., in press, chapter 5, our italics). In this sense, bonding is a collateral effect. In their future work, the proponents of gentle teaching may wish to clarify this issue, provide an operational definition of bonding, specify behavioral assessment methods for quantifying bonding, and delineate procedures for ensuring the development of bonding when it does not "automatically" develop.

Although this study has a number of limitations and we suspect that our interpretation of gentle teaching techniques will be questioned by some, nevertheless we hope that the study will provide the impetus for further data-based independent evaluations and research. Future investigations will need to define operationally gentle teaching and have experimental procedures rated or scored for adherence to criteria that adequately characterize gentle teaching. Only well-controlled, data-based investigations will enable us to determine the most effective but least intrusive treatment alternatives for controlling severe behavior problems.

In summary, although gentle teaching is promoted as a combined philosophy and treatment package that should be used for the entire gamut of behavior problems, our results indicate that uncritical acceptance of the approach and exclusion of other data-based treatments are not warranted. Furthermore, although the humanistic principles of gentle teaching and its proponents' condemnation of the inappropriate uses of punishment are highly laudable, we argue that simply eschewing the use of punishment cannot be justified scientifically. Indeed, the widespread use of the least restrictive model and the heightened awareness of ethical concerns evident in the mainstream behavioral literature today indicate that protecting the rights of clients is of paramount concern. This includes their right to most effective treatment, which in some cases, may involve the use of punishment as a last resort (Bailey, 1987).

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